

BI-STABLE SPRING WITH FLEXIBLE DISPLAY

BACKGROUND

[0001] 1. Field of the Described Embodiments

[0002] The described embodiments relate generally to portable electronic devices. In particular methods for expanding the functionality of electronic devices are disclosed.

[0003] 2. Related Art

[0004] Bi-stable springs have two equilibrium positions. This allows a device with a bi-stable spring to assume two distinct configurations. The most recent widespread use of such a device was the slap bracelet, also called the slap wrap. The slap bracelet consists of layered flexible steel bands sealed within a fabric cover. Typical slap bracelets are roughly one inch in width by nine inches in length. In a first equilibrium position they can be flat. The second equilibrium is typically reached by slapping the flat embodiment across the wrist, at which point the bracelet curls around the wrist and stays relatively secure in a roughly circular position. The slap bracelet has been used primarily as a decorative bracelet; however, other uses have included for example keeping a pant leg away from a bike chain, or even using a slap bracelet covered with reflective tape for providing increased visibility for pedestrians and bikers at night. Perhaps most usefully it is quite easy to wrap around a wrist or leg, and stays conveniently in place.

[0005] Conversely conventional accessories for electronic devices do not tend to be easily wearable. They include various clips or may even rest precariously on an ear. In some cases accessory devices may even have to sit in a pant or coat pocket. Therefore an apparatus that capitalizes on the easily wearable nature of a bi-stable spring is desired

SUMMARY OF THE DESCRIBED EMBODIMENTS

[0006] This paper describes various embodiments that relate to an apparatus, method, and apparatus with a display and associated electronics.

[0007] A wearable video device arranged to be worn by an end-user is disclosed. The wearable video device includes the following: (1) a flexible substrate having a flat state and a curled state; and (2) a flexible display disposed upon a first surface of the flexible substrate, where in the curled state the flexible substrate conforms to an appendage of the end-user. The flexible substrate also includes an electronic module in communication with the flexible display, the electronic module providing information to the display, at least a part of which is presented in real time for presentation by the display.

[0008] A method for passing information between an accessory device disposed on one surface of a bi-stable spring substrate and a portable electronic device is disclosed. The accessory device includes a flexible display arranged to present a first set of visual information. The portable electronic device has a portable electronic device display arranged to present a second set of visual information. The method includes the following steps: (1) determining whether the accessory device is being worn by an end-user where the determining is accomplished by at least one sensor on the accessory device; (2) when it is determined the accessory device is being worn by the end user, establishing a communication channel between the accessory device and the portable electronic device where the communication channel is

arranged to provide a bi-directional communication link between the flexible display and the portable electronic device; (3) passing information between the portable electronic device and the accessory device by way of the bi-directional communication link, where at least a portion of the passed information is presented by the flexible display as the first set of visual information; and (4) displaying the first set of visual information by the flexible display.

[0009] A slap bracelet configured to display information wirelessly transmitted from a portable electronic device is disclosed. The slap bracelet includes at least the following components: (1) a communication link, allowing two-way communication between the slap bracelet and the portable electronic device; (2) a flexible display disposed over a portion of a first surface of the slap bracelet; (3) a touch sensitive user interface disposed over the top of the flexible display; and (4) an electronic module disposed on one end of the first surface of the slap bracelet. Information generated on either device can be displayed on either the host device display or the flexible display.

[0010] A non-transitory computer readable medium for storing computer instructions executed by a processor in a portable electronic device for controlling a flexible accessory device mounted on a bi-stable spring substrate in wireless communication with the portable electronic device is disclosed. The non-transitory computer readable medium includes the following: computer code for establishing a communication channel between the flexible accessory device and the portable electronic device; computer code for receiving a user input on a first user interface built into the portable electronic device; computer code for interpreting the user input with the portable electronic device processor; computer code for sending display data across the communication channel; and computer code for displaying the display data on a flexible accessory device display.

[0011] Other aspects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the described embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The described embodiments and the advantages thereof may best be understood by reference to the following description taken in conjunction with the accompanying drawings. These drawings in no way limit any changes in form and detail that may be made to the described embodiments by one skilled in the art without departing from the spirit and scope of the described embodiments.

[0013] FIG. 1 shows a conventional slap bracelet with a flexible display fastened to one surface.

[0014] FIGS. 2A and 2B show cross sectional views of an accessory device in accordance with the described embodiments.

[0015] FIGS. 3A and 3B show perspective views of an accessory device in accordance with the described embodiments.

[0016] FIGS. 4A and 4B show cross sectional views of an accessory device with an edge to edge flexible display in accordance with the described embodiments.

[0017] FIGS. 5A and 5B show perspective views of an accessory device with an edge to edge flexible display in accordance with the described embodiments.